

- [c1]

 1.A method of adaptively controlling the speed of a reference vehicle having a controller comprising:
 detecting a target vehicle;
 setting a reference vehicle headway distance indicative of a desired separation between said reference vehicle and said target vehicle;
 receiving at said reference vehicle, target vehicle data from said target vehicle; and modifying said reference vehicle headway distance as a function of said target vehicle data.
- [c2] 2.A method according to claim 1 wherein said target vehicle data includes a braking capability value (BC $_{\rm T}$) for said target vehicle, and wherein the step of modifying includes modifying said reference vehicle headway distance as a function of said BC $_{\rm T}$.
- [c3] 3.A method according to claim 1 wherein said target vehicle data includes data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; target vehicle speed; or a road condition value.
- [c4] 4.A method according to claim 2 wherein modifying said reference vehicle headway distance includes increasing said reference vehicle headway distance if said BC $_{\mathsf{T}}$ indicates less than an optimum braking capability.
- [c5] 5.A method according to claim 1 wherein said target vehicle data includes a target vehicle operator attention value indicative of a level of potential target vehicle operator distraction.
- [c6] 6.A method according to claim 1 comprising: determining a braking capability value (BC $_{\rm R}$) for said reference vehicle, and wherein said step of modifying includes modifying said reference vehicle headway distance as a function of said BC $_{\rm R}$.
- [c7] 7.A method according to claim 6 wherein determining said BC $_{\hbox{\scriptsize R}}$ comprises analyzing reference vehicle data comprising at least one of: a tire pressure

value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; reference vehicle speed; or a road condition value.

- [c8] 8.A method according to claim 6 wherein modifying said reference vehicle headway distance includes increasing said reference vehicle headway distance if said BC $_{\rm R}$ indicates less than an optimum braking capability.
- [c9] 9.A method according to claim 7 wherein said reference vehicle data includes a reference vehicle operator attention value indicative of a level of potential reference vehicle operator distraction.
- [c10] 10.A method of adaptively controlling the speed of a reference vehicle having a controller comprising:

 detecting a target vehicle;

 setting a reference vehicle headway distance indicative of a desired separation between said reference vehicle and said target vehicle;

 receiving at said reference vehicle, a braking capability value (BC T) for said target vehicle;

generating a braking capability value (BC $_{\rm R}$) for said reference vehicle; and modifying said reference vehicle headway distance as a function of said $_{\rm RC}$ and said

BC_R.

- [c11] 11.A method according to claim 10 wherein determining said BC R comprises analyzing reference vehicle data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; reference vehicle speed; or a road condition value.
- [c12] 12.A method according to claim 11 wherein said BC his generated at said target vehicle as a function of target vehicle data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; reference vehicle speed; or a road condition value.
- [c13] 13.A method according to claim 10 wherein said BC $_{\overline{T}}$ includes a target vehicle operator attention value indicative of a level of potential target vehicle operator distraction.



- [c14] 14.A method according to claim 10 wherein said BC $_{
 m R}$ includes a target vehicle operator attention value indicative of a level of potential target vehicle operator distraction.
- [c15] 15.A method according to claim 10 wherein modifying includes increasing said reference vehicle headway distance if said BC $_{\rm R}$ indicates less than an optimum braking capability.
- [c16] 16.A method according to claim 10 wherein modifying includes decreasing said reference vehicle headway distance if said BC T indicates less than an optimum braking capability.
- [c17] 17.An adaptive cruise control system for a reference vehicle comprising:

 a memory for storing reference vehicle data;

 a detection system for detecting a target vehicle;

 a receiver receiving target vehicle data from said detected target vehicle; and

 a controller coupled to said memory for adaptively controlling a speed of said

 reference vehicle to maintain a reference vehicle headway distance indicative of

 a desired separation between said reference vehicle and said target vehicle,

 wherein said reference vehicle headway distance is generated as a function of
 said reference vehicle data and said target vehicle data.
- [c18] 18.A system according to claim 17 wherein said reference vehicle data includes a braking capability value (BC $_{\rm R}$) for said reference vehicle.
- [c19] 19.A system according to claim 18 wherein said target vehicle data includes a braking capability value (BC $_{T}$) for said target vehicle.
- [c20] 20.A system according to claim 17 wherein said reference vehicle data includes data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; target vehicle speed; or a road condition value.